

A NEW LOACH OF *Schistura* AND COMMENTS ON THE GENUS

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Abstract *Schistura heterognathos* Chen, sp. nov. is described based on specimens from the Nanla River, a tributary of the Lancangjiang River (upper Mekong River), in Yunnan Province of China. It is especially characterized by its abnormal jaws. The jaws are broad, thick and strong. The upper jaw has no dentoid process and there is a very small or no notch in the lower jaw. The dissociative margins of jaws are straight. The mouth is broad and transversal, its width approximately equals to snout length and is greater than the interorbital width.

Key words *Schistura*, New species, Monophyly, Yunnan

1 Introduction

Above 100 species and subspecies of nemacheiline loaches are known from various areas of China which were described and summarized into 16 genera by Zhu (1989); *Barbatula* Link, 1790; *Schistura* McClelland, 1839; *Paracobitis* Bleeker, 1863; *Nemacheilus* Bleeker, 1863; *Oreonectes* Günther, 1868; *Oreias* Sauvage, 1874; *Lefua* Herzenstein, 1888; *Yunnanilus* Nichols, 1925;? *Aborichthys* Chaudhuri, 1931; *Triplophysa* Rendhal, 1933; *Micronemacheilus* Rendhal, 1944; *Paranemacheilus* Zhu, 1983; *Heminoemacheilus* Zhu, 1987; *Sphaerophysa* Cao et Zhu, 1988; *Neonemacheilus* Zhu et Guo, 1989; *Protonemacheilus* Yang et Chu, 1990.

In 1988, I took photos for "The Freshwater Fishes of China in Colored Illustrations" and collected many specimens from Yunnan. While examined nemacheiline loaches I found out seven specimens having the same type of jaws and representing a new species.

The present paper focuses on describing the new species, *Schistura heterognathos* Chen, sp. nov., then a short comment on the monophyly of *Schistura* is made.

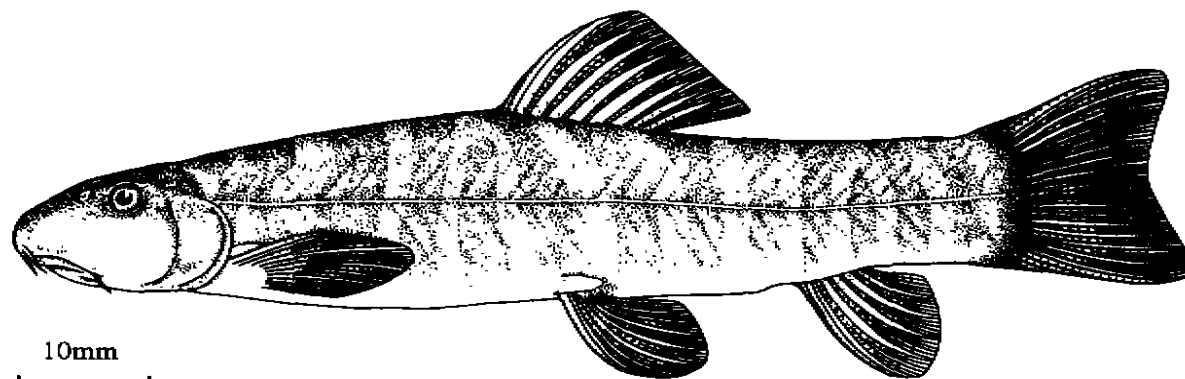
2 *Schistura heterognathos* Chen, sp. nov. (Fig. 1)

Holotype: No. 8810240, one specimen, total length 99.0 mm, standard length 80.0 mm; female; from Nanla River (the Mekong River system), Nazhao (101°35'20" E, 21°40'55" N), about 25 km from Mengla County, Yunnan Province, China, 13 November 1988.

Paratypes: 6 specimens, total length 95.0 - 105.0 mm, standard length 77.0 - 87.0 mm; male and female; No. 8810241, 8810242, same locality and same date as holotype; No. 8810150 - 8810153, collected at Manzhuang (101°34'37" E, 21°29'27" N), about 1 km from Mengla County, 12 November 1988.

All type specimens are kept in the Institute of Hydrobiology, the Chinese Academy of Sciences.

Diagnosis: the new nemacheiline loach especially characterized by its abnormal jaws. The jaws are broad, thick and strong, without horny edges. The upper jaw has no dentoid process and the lower jaw has a very small or no notch, their dissociative margins are straight. The mouth is broad and transversal, and its width approximately equals to snout length and is greater than the interorbital width. Some points (e. g. the prominent cheeks and color

Fig.1 *Schistura heterognathos* Chen, sp. nov.Table 1 Morphometric data of *Schistura heterognathos* Chen, sp. nov. (mm)

	8810240 ♀	8810150 ♀	8810151 ♂	8810152 ♀	8810153 ♀	8810241 ♂	8810242 ♀
Total length	99.00	98.00	105.00	96.00	95.00	100.00	102.00
Standard length	80.00	80.00	87.00	78.00	77.00	81.00	82.50
Body depth	16.00	16.00	18.00	15.00	15.00	16.50	16.00
Head length	18.00	18.00	19.50	17.50	17.00	18.50	19.00
Head depth	11.00	11.50	11.50	10.50	10.50	11.00	11.50
Head width	14.00	14.50	17.00	14.00	13.50	15.00	14.00
Mouth width	7.50	8.00	9.50	7.50	7.50	8.00	8.50
Snout length	8.00	8.00	8.50	7.50	7.50	8.00	8.50
Eye diameter	3.00	3.50	3.50	3.00	3.50	3.50	3.00
Postorbital distance	8.00	7.50	9.00	7.50	7.00	8.50	8.00
Interorbital space	4.50	4.50	5.50	4.50	4.50	4.50	5.00
Barbel length							
Inner rostral	2.50	3.00	3.50	3.00	2.50	3.00	3.50
Outer rostral	4.00	4.00	5.00	4.50	4.00	4.00	4.50
Maxillary	3.50	4.00	5.00	4.00	4.00	4.00	4.50
Predorsal length	41.00	41.50	43.50	39.00	40.00	40.50	43.50
Caudal peduncle length	8.50	9.50	10.50	9.00	8.50	9.00	9.00
Caudal peduncle depth	11.00	10.00	12.00	10.00	10.00	10.50	11.00
Distance between pelvic and pectoral fin insertions	29.00	28.50	29.00	27.50	26.50	27.50	30.00
Basal length of dorsal fin	15.00	14.50	15.50	15.00	14.50	14.50	15.00
Dorsal fin height	13.00	12.00	13.50	12.50	13.00	12.50	13.50
Basal length of anal fin	6.50	6.50	7.50	6.50	6.50	6.50	6.50
Anal fin length	14.00	14.00	15.50	14.00	14.00	14.00	14.50
Pectoral fin length	16.50	15.50	16.50	15.50	15.50	16.50	17.50
Pelvic fin length	13.50	14.50	14.50	13.50	13.50	14.00	14.50

pattern) are also more or less different from other species of *Schistura*.

Description: the morphometric data are given in Table 1.

D. iv-8; A. iii-5; P. i-9-10; V. i-6-7; C. (branched) 16-17. Gill rakers (inner) 15-17. Vertebrae 4+31-32.

Depth of body 4.8-5.2 in standard length, length of head 4.3-4.5, length of caudal peduncle 8.3-9.4, its depth 7.3-7.8. Length of snout 2.3 in length of head, diameter of eye 5.1-6.3, width of interorbital space 3.6-4.1, width of mouth 2.1

- 2.4, length of outer rostral barbel 3.9-4.5. Depth of caudal peduncle 1.1-1.3 in its length.

Body elongate, compressed posteriorly and cylindrical between the dorsal fin and the head; the depth of caudal peduncle is longer than its length. The head moderately depressed, wider than high; its length is longer than the body depth; ventral surface flattened. The snout is broad and evenly rounded. Cheeks moderately prominent. The eyes small, dorsolateral in the midway of head. The nostrils are close together and nearer to eye than to tip of the

snout; anterior nostril is in a small and short tube which formed by the nasal tentacle. Barbels six, the outer rostral is the longest one and its length is longer than or equal to the length of the maxillary barbel, its tip reaches to the corner of mouth and under the anterior nostril; the tip of maxillary barbel reaches or exceeds under the middle of eye. The mouth is transversal and broad, its width is about the snout length and greatly longer than the interorbital width. The lips are moderately thick, the upper one is smooth and continuous; the lower one is moderately furrowed and has a slight median incision. The jaws are thick and broad and keep close to the lips. Their dissociative margins are straight; the upper jaw has no dentoid process and the lower jaw has or has not a very small incision (Fig. 2).

The sensory of the head is not very obvious, it presents on snout, cheeks and the top of head. They are particularly around eyes.

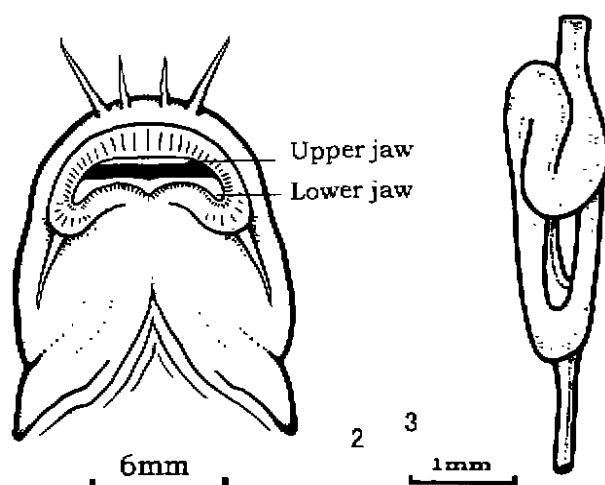
Scales are small and roundish, with zones rapidly reduced from the center to margin. They cover posterior body part behind the origin of the dorsal fin, absent on belly. The lateral line reaches to the base of caudal fin, almost straight, perforating 71–82 scales.

Origin of dorsal fin to the tip of snout is close to the base of caudal fin, its edge slightly invaginated, lobes rounded. Pectoral fin is short and its tip does not reach origin of ventral fin; tip of ventral fins approach anus. Anus is slightly in front of anal fin.

Intestine shaped as "Z" form; the first loop is under the stomachic dilatation and then covered the second one (Fig. 3). The two chambers of the air bladder capsule are developed, wider than long, with a pointed posterior prolongation (Fig. 4). Peritoneum is blackish.

Sexual dimorphism; there is no preocular flaplet, but first pectoral ray is slight expand in female than in male (as the same size).

Colour pattern: body is light yellowish with 13 to 15 brown transverse bars, which extend below as far as the level of pectoral or anal fin; the anterior ones are more or less wider than the posterior ones and the



Figs. 2–3 Ventral view of head and the digestive tract of paratype

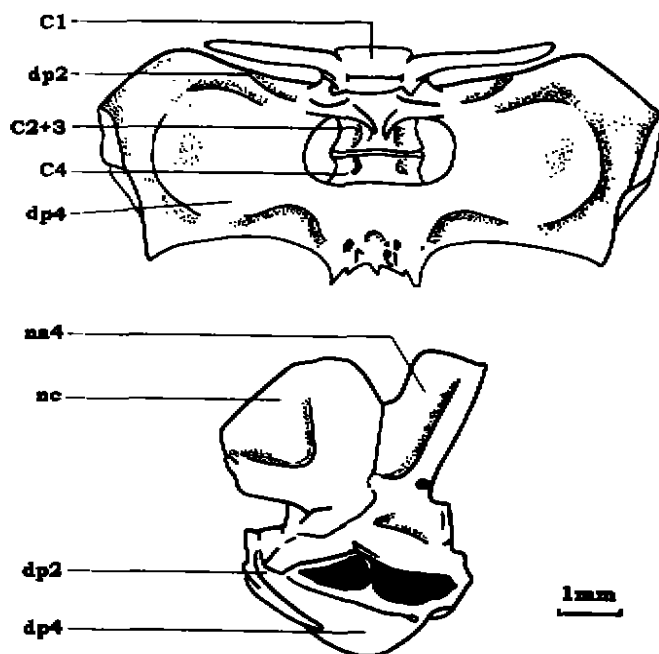


Fig. 4 The bony capsule of paratype, No. 8810152

Upper: ventral view; Lower: lateral view.

C1: 1st centrum; C2 + 3: united centrum of vertebrae 2 and 3; C4: centrum of vertebra 4; dp2: descending process of the 2nd vertebra; dp4: descending process of the 4th vertebra; na4: 4th neural arch; nc: neural complex.

width anteriorly is wider than or posteriorly equals to the interspaces. There are 4 or 5 predorsal, 3 sub-dorsal, 6 to 8 postdorsal. The middle and base of the dorsal fin are brown, and there is a reddish orange spot at the base of second branched ray. There is an orange big spot at the upper part of caudal peduncle

before the caudal fin base. Paired fins and anal fin are yellowish, generally the rays of pectoral fins with somewhat brownish. The middle of the caudal fin is brownish, rarely with two rows of vague spots shaped as "V" form.

Ecology: at the collection place, the river with rapid current over gravelly and sandy bottom, while the water depth is about 30–50 cm. Other nemacheiline loaches occurring together with *S. heterognathos* are: *S. thai* (Fowler), 1924; *S. fasciolatus* (Nichols et Pope), 1927; *S. meridionalis* (Zhu), 1982.

Range: the new nemacheiline loach lives in the Nanla River, a small branch of the Mekong River. It is only found in Xishuangbanna (Mengla County, 101°06′–101°50′ E, 21°08′–22°25′ N), Yunnan Province, an area in China neighbours with Laos and Thailand.

Relationships: the colour pattern of the new species is similar to *S. fasciolatus*, *N. waltoni*, *N. schutzi* and *N. degnani*; the prominent cheeks are similar to *S. thai* and *S. bucculenta*, but these species are not with a broad and transversal mouth; *S. heterognathos* is unique among Thailand, Laos and Chinese nemacheiline loaches by its lower jaw with an almost straight dissociative margin.

3 Discussion

The subfamily Nemacheilinae distributes all over the Eurasia continent and Northern Africa, and its differentiation is very distinct. *Cobitis* (= *Schistura*) *rupecula* was recorded in Simal (Northwest of India) by McClelland (1839) and was designated as genotype of *Schistura* by Jordan (1919). Just as Mirza et al. (1981) commentated: "A difficult problem is the nomenclatorial status of the genus. It was proposed by McClelland (1839) as subgenus of *Cobitis*.

The original diagnosis is incomplete; some characters mentioned apply to botiine, others to noemacheiline loaches (e.g. 'with or without suborbital spines')". At the same paper, Mirza et al. divided the genus into three groups, some species with a well-developed adipose crest in the posterior part of the caudal peduncle (e.g. *S. alepidota*) or the male with a well-developed preocular flap and other sexual dimorphism (most species of group naseeri-baluchiorum). Furthermore, Zhu (1989) divided these species into *Nemacheilus* (with a preocular flaplet in male) and *Paracobitis* (with an adipose crest in the posterior part of the caudal peduncle), then the others (without one of these characters) belong to *Schistura*.

Among the authors from McClelland established the subgenus *Schistura*, Jordan (1919) designation of *Cobitis rupecula* as genotype of *Schistura*, but he considered the genus as a synonym of *Barbatula* at the same time. The others, e.g. Valenciennes (1846) and Day (1878) considered *Schistura* as a synonym of *Cobitis*, Bleeker (1863) as a synonym of *Botia*. Certainly, more authors considered *Schistura* as a synonym or as a subgenus of *Nemacheilus*. In spite of Mirza et al. (1981) and Zhu (1989) gave *Schistura* a diagnosis and definition, it is obviously that there is no any of the differential diagnoses which is unique to the genus of *Schistura*. In the other words, *Schistura* is a taxon without autapomorphic character at present.

Etymology: the heterognathos means "jaws with different shape".

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南鳅属鱼类一新种及南鳅属评述

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摘要 记述了南鳅属鱼类一新种——异颌南鳅 *Schistura heterognathos* sp. nov.。用作新种描述的模式标本共 7 尾, 其中正模标本 1 尾, 体长 80.0 mm, 编号 8810240; 副模标本 6 尾, 体长 95.0 ~ 105.0 mm, 编号 8810241、8810242、8810150 ~ 8810153。1988 年采自云南省勐腊县的那着和曼庄, 属澜沧江下游支流南腊河。所有模式标本均保存于中国科学院水生生物研究所鱼类标本馆。

该新种上下颌厚而强壮, 宽阔, 无角质; 上颌无齿状突起, 下颌中部有一细小缺刻或无缺刻; 口

横列, 口宽约等于吻长而大于眼间距; 颊部突出, 尾柄较高; 体侧具 13~15 垂直条纹; 尤其是以其上、下颌的游离缘几近平直为特征而有别于其他条鳅亚科鱼类。

本文还进一步对南鳅属进行了讨论, 认为尽管 Mirza 等(1981)及朱松泉(1989)都对南鳅属及其相关的属如条鳅属 (*Nemacheilus*)、副鳅属 (*Paracobitis*) 等进行了定义, 并对南鳅属的特征进行了限定, 但就目前来看, 这些特征没有一个是南鳅属的自体近裔性状 (autapomorphic character)。

关键词 异颌南鳅, 新种, 单系, 云南

中图分类号 Q959.468